Preliminary Report and Facility Improvement Analysis
for
RSU13 School District

Submitted by:
Siemens Industry Inc.
June 2016

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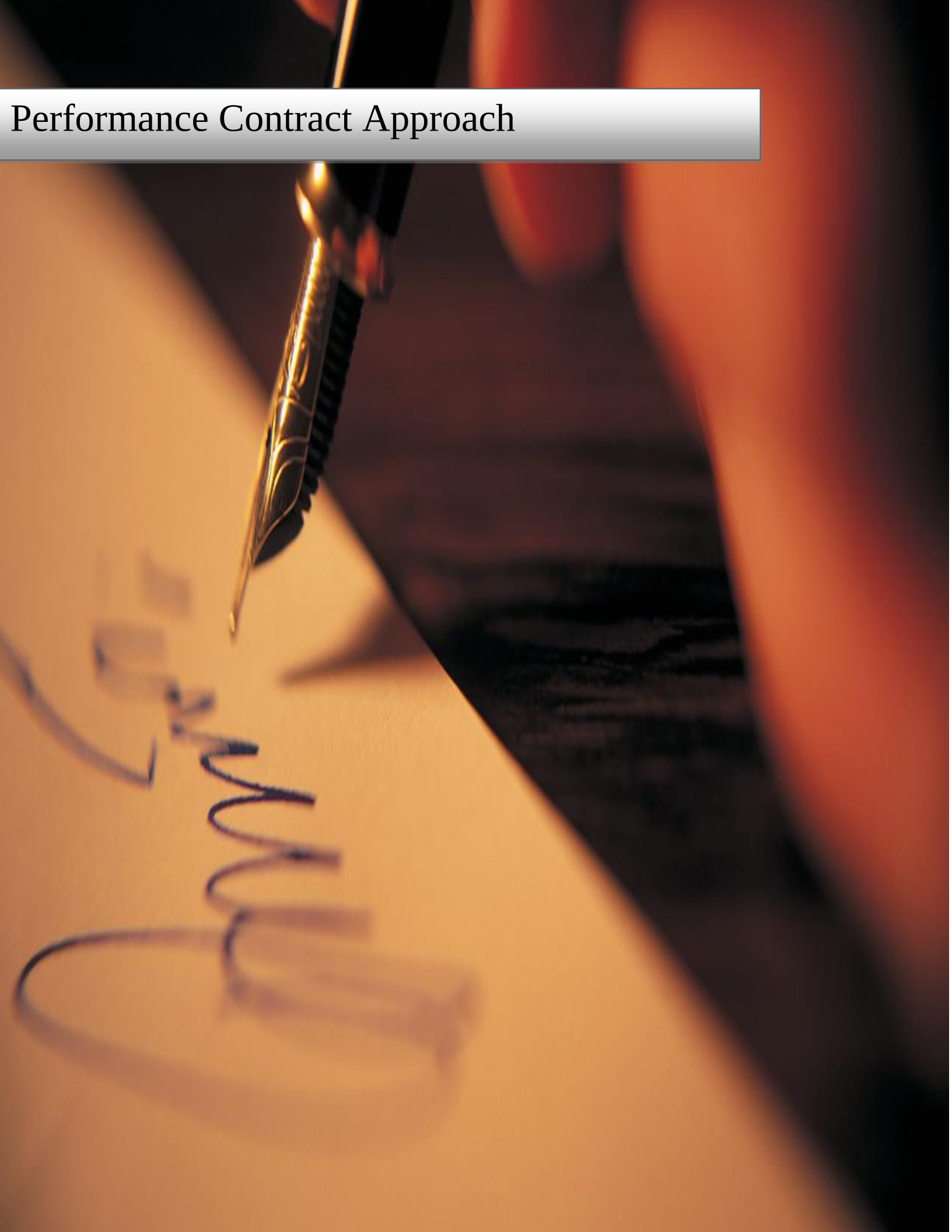
Performance Contract Approach



Performance Contracting Approach to Achieving Self Funded Energy Conservation Measures and Facility Improvements:

Siemens' Energy Performance Solutions Program is a customized program designed to reduce energy and operating costs through the implementation of infrastructure and management improvements. The program is financed through Siemens within existing utility budgets and requires no capital monies or additional ongoing expense.

Some benefits of the program include:

- Improved facility infrastructure
- Lowered operating costs
- Self-funded modernization of infrastructure
- Guaranteed cost reductions
- Reduced financial risk
- Improved operating efficiencies
- Improved occupant satisfaction and comfort

What is Performance Contracting?

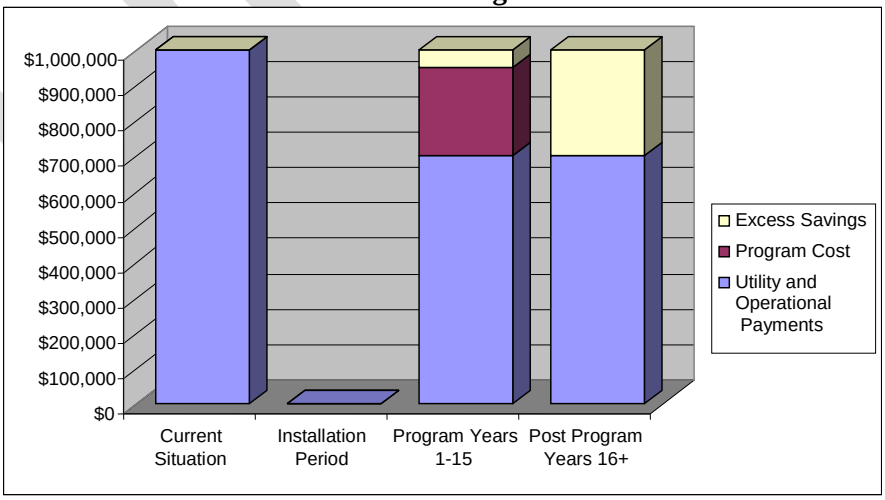
Performance contracting is a procurement process that enables k-12 districts to use energy savings within their existing buildings to fund necessary building upgrades, retrofits and other improvements (i.e. fire and security, infrastructure improvements, etc.) without having the customer budget any money (capital dollars).

Siemens installs energy efficient equipment (lighting, controls, boilers, chillers, etc.), which reduces their existing energy budget and pays for the new equipment over time.

There are no upfront costs and annual savings are guaranteed over the term of the agreement.

The following graph is a representation of the benefits of reallocating saved energy and operating dollars into facility improvements:

Current Expenditures vs. Performance Solutions Program Investment



(Hypothetical)

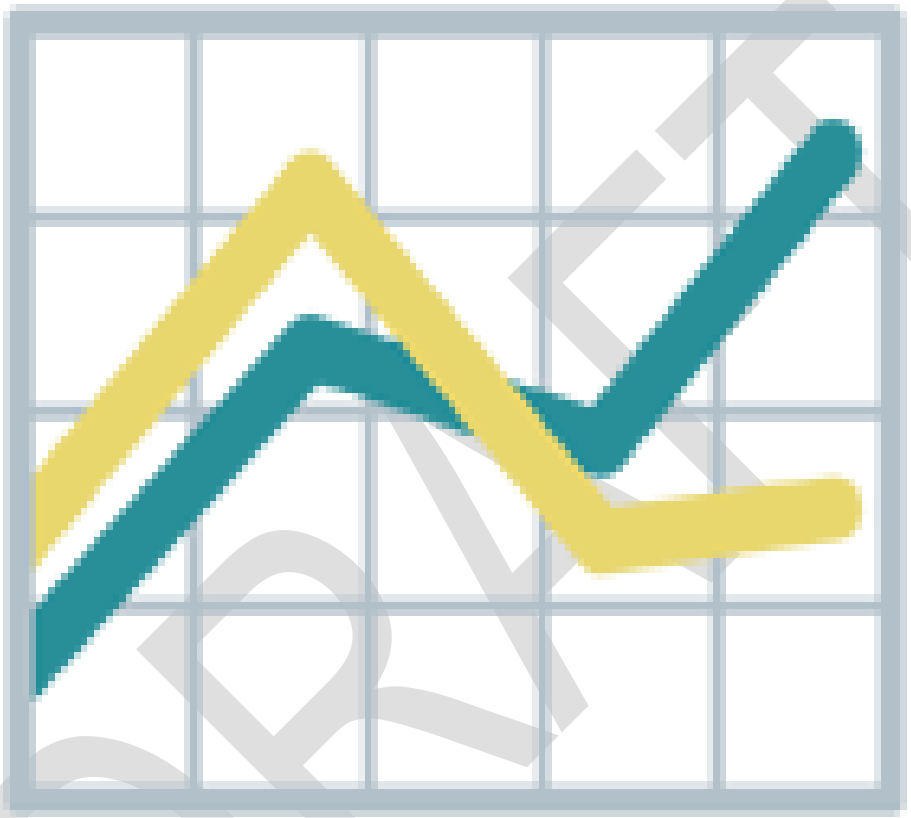
RSU 13
REGIONAL SCHOOL UNIT 13

Project Objectives

The objectives of this project are as follows:

- Achieve significant long term savings.
- Leverage all financial resources available, including but not limited to, the Federal Government and Efficiency Maine.
- ***Develop, fund and implement a formal plan to address the inadequate electrical capacity at both campuses.*** *(Reference Facility Improvement Measure 14- Electrical System Upgrade)*
- ***Develop, fund and implement a plan to address the insufficient size of cafeteria and kitchen facilities at both campuses.*** *(Reference Facility Improvement Measure 5- Food Service Improvements)*
- ***Develop, fund and implement a plan to address the locker room deficiencies including lack of lockers, uneven floors and lack of accessibilities*** *(Reference Facility Improvement Measure 12- Classroom Environment Improvement Measure)*
- ***Develop, fund and implement a plan to replace outdated single pane window walls and to address the water and air infiltration.*** *(Reference Facility Improvement Measure 7- Window Retrofit)*
- ***Develop, fund and implement a formal plan to address extreme temperature variation which exists from room to room throughout the facilities.*** *(Reference Facility Improvement Measure 2-Building Automation Improvements, as well as Measures 3,7 and 9)*
- ***Develop, fund and implement a plan to ensure access to ensure access to fully accessible restrooms for staff and students at each campus.*** *(Reference Facility Improvement Measure 12- Classroom Environment Improvement)*
- ***Work directly with the district to bring Siemens Sustainability and Education programs, lessons and initiatives to the classroom level.***
- ***Involve the students of RSU13 in the development and educational opportunities of the energy reduction project, giving them a real world approach to STEM Education.***
- Supporting and addressing district goals on facility reorganization, including adding pre-k to elementary schools.
- Achieve a guarantee for potential energy, and operations and maintenance savings.
- Obtain consistent levels of occupant comfort and building functionality.
- Capture ancillary benefits that may accrue as a direct result of such energy related services and capital improvements.

Utility Data Analysis



Utility Information

Table 2.1 includes the 3 year average (FY 2011-2014) 12-month electric utility data for the district. Electric is delivered by Central Maine Power. The gross average electrical cost for the district was $0.11/kWh.

Table 2.1: 3year average Electric Usage

School	Usage KWH	$ Spend
Cushing Community School	94,587	$10,380
Gilford Butler School	45,340	$6,101
Lura Libby School	121,159	$13,564
Owls Head Central School	34,235	$4,796
Rockland District Middle School	332,640	$35,035
South School	157,074	$17,127
Thomaston Grammar School	174,480	$18,837
Georges Valley H.S.	276,560	$29,763
Rockland District H.S.	355,360	$35,536
Superintendent Office	157,313	$16,484
TOTAL	1,596,725	$175,727

Table 2.2: District Wide 3 Year Comparison Utility Costs per Month

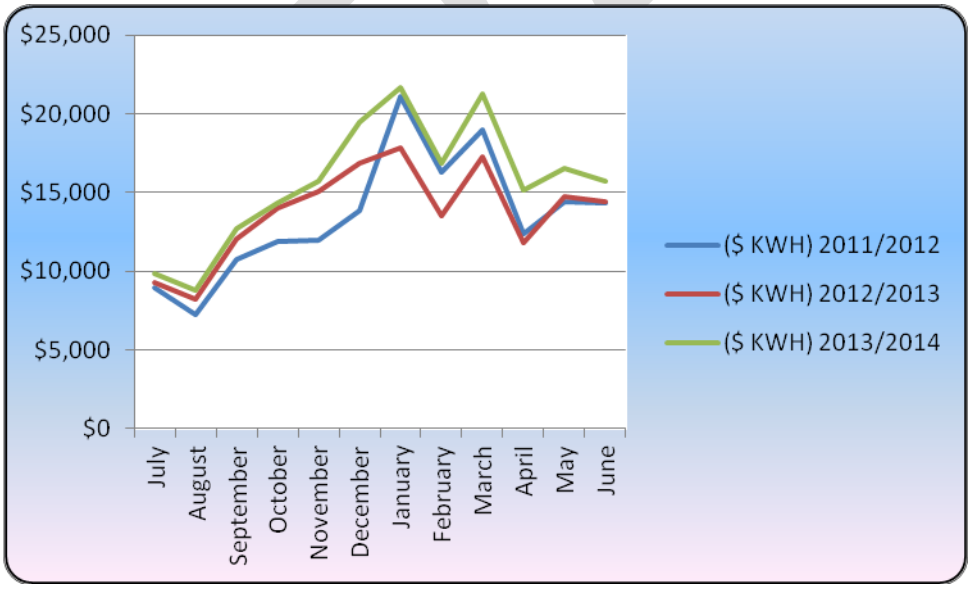
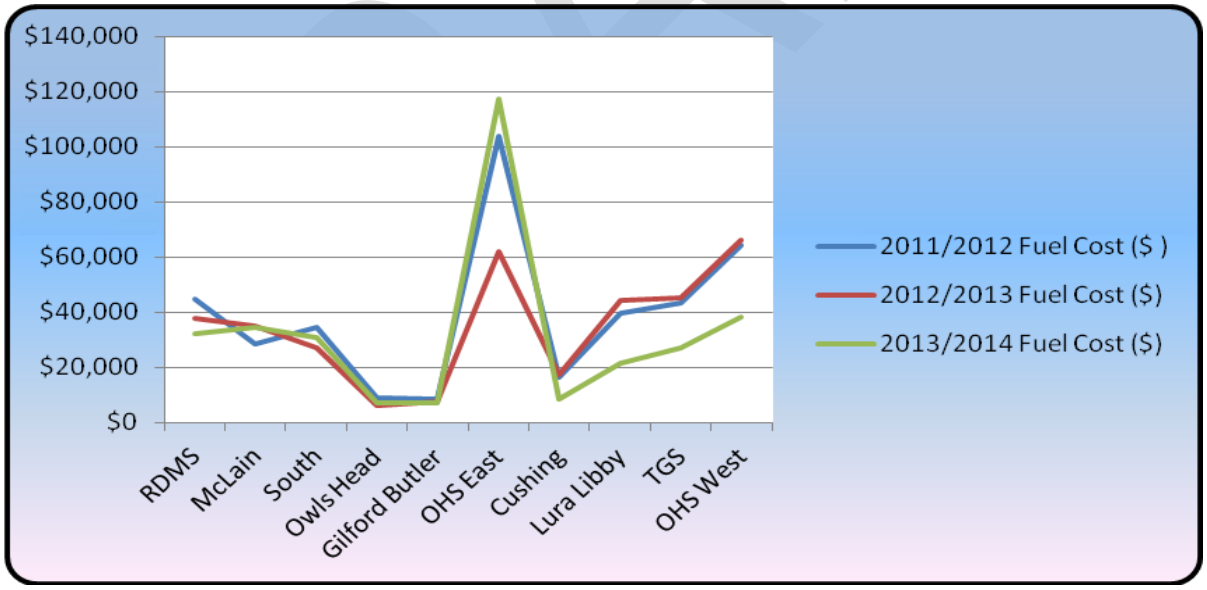


Table 2.3 includes the 3 year average (FY 2011-2014) Fuel Oil use data for district. Fuel oil is delivered by Maritime Energy. The gross average cost per Therm of gas was $3.21/gallon.

Table 2.3: Fuel Oil Billing History: RSU13

School	Gallons	$ Spend
Rockland Middle School	11,891	$38,249
McLain Building	10,077	$32,485
South School	9,561	$30,832
Owls Head	2,197	$7,441
Gilford Butler	2,388	$7,691
Oceanside High School East	29,150	$94,329
Cushing Community	4,373	$14,005
Lura Libby	11,340	$35,154
Thomaston Grammar	12,006	$38,506
Ocean High Side West	17,527	$56,190
TOTAL	**110,508**	**$354,882**

Table 2.4: FY District Fuel Cost for 3 Years

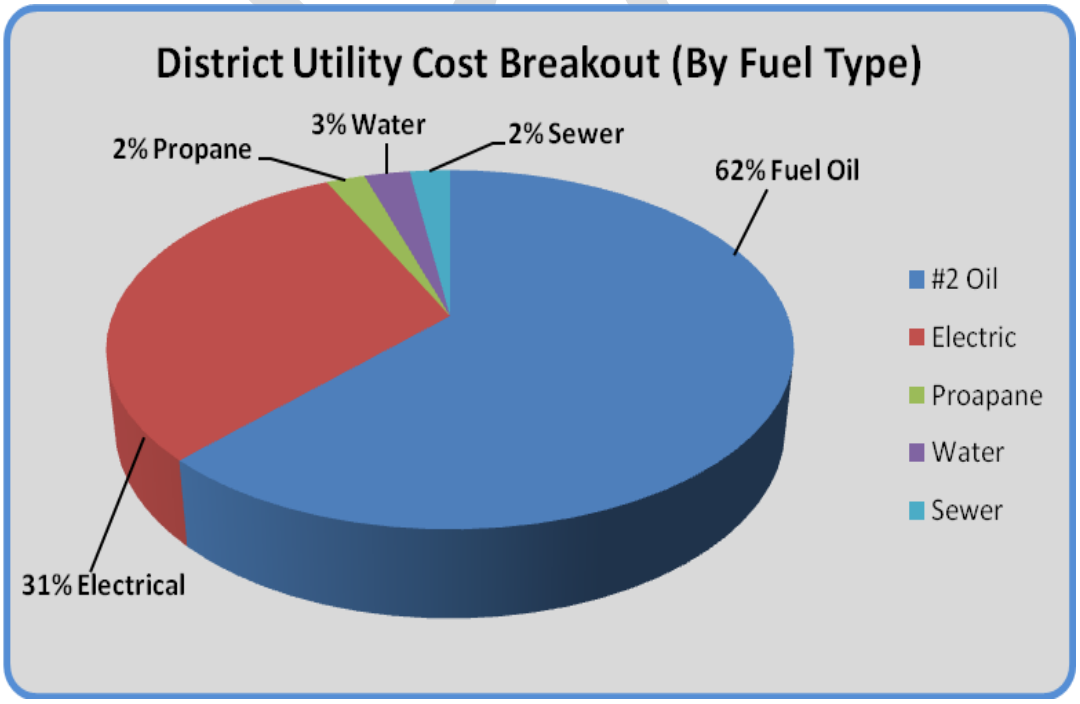


Utility Benchmark Data

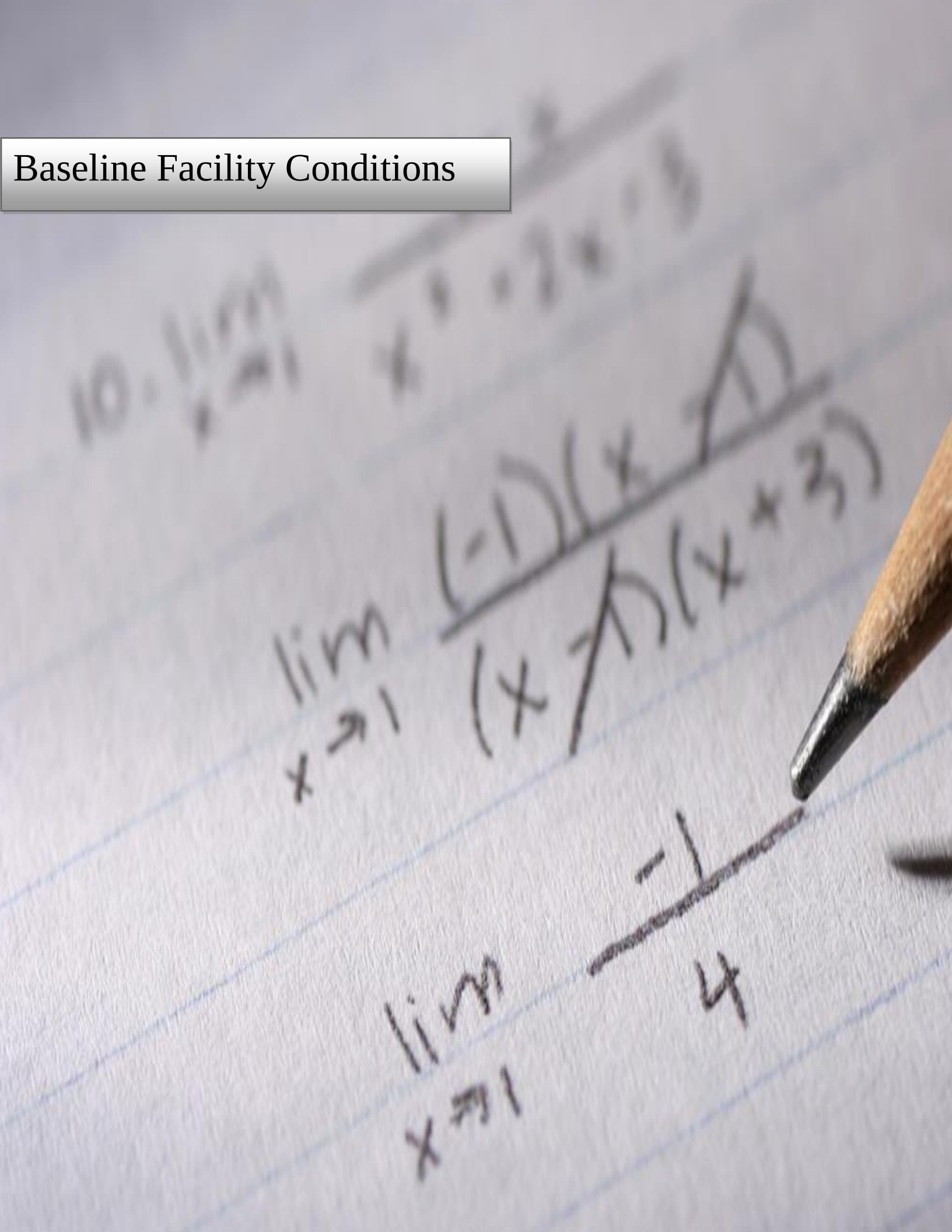
School	kBTU/sq.ft
CBECS National Average EUI k-12	50
Cushing Community School	67.4
Gilford Butler School	41.8
Lura Libby School	89.6
Owls Head Central School	36.7
Rockland District Middle School	21.8
South School	65.5
Thomaston Grammar School	65.6
Georges Valley H.S.	66.3
Rockland District H.S. (EAST)	40.0
Superintendent Office	69.3

** **Commercial Building Energy Consumption Survey (CBECS)**, conducted in 2003, was used to calculate the values presented in this table. The data is gathered from the Dept. of Energy's – Energy Information Administration (EIA). These are building types that are not currently available in EPA's Portfolio Manager or Target Finder tools. Please note all source and site EUI values displayed are annual figures. The average Site EUI is calculated in kBtu/sqft as weighted averages across all buildings of a given type in the 2003 CBECS data set.

The total annual utility spend for the nine surveyed buildings, including electricity, natural gas, No. 2 Oil, water and sewer, is approximately $570,692. The following pie chart illustrates the district utility spend by utility type.



Baseline Facility Conditions



Baseline Facility Conditions

Oceanside High School East

square feet: 50,950

***Year Built*: Original- 1963**

Use: High School

Energy Use Index (EUI): 66.3

Systems	Description
Lighting	• Classrooms and offices are T-8 lighting with manual switches. • Gymnasium lighting is HID • Fluorescent lighting still throughout facility • Exterior lighting is CFL lighting and mounted HID fixtures, all on 1 manual switch.
Mechanical/ HVAC	• (2) Smith old boilers (3297 MBH) • Hot water control valves for radiators, which are controlled by room thermostats. • Point of Use electric water heaters, the current storage tank is no longer in use. • 6,000 gallon underground tank • (1) Rooftop AHU for the gymnasium • Hot water system supplies the AHU coils, unit ventilators and classroom baseboard throughout the building. • Classrooms and offices are vented through roof mounted exhaust fans with no supply air.
Controls	• Older outdated controls • Control the AHU and the exhaust fans

Oceanside High School West

135,000 square feet

***Year Built*: 1962**

***Use:* High School**

Facility Equipment Description

Systems	Description
Lighting	• Classrooms are lit with drop in T-8 Fluorescent • Gym uses metal halide fixtures • Limited occupancy sensors • Exterior are incandescent light bulbs • Exterior wall mount HIDs
Mechanical/ HVAC	• (2) HB Smith 28A-13 Boilers • 2 Air handler for Gym and wall radiators • (2) DHW systems (hand use and kitchen use) are heated using the boilers year round. • (3) 100 gallon SuperStor tanks for the hand use system • (2) 160 gallon system for the kitchen use system. • Issues with heating due to poor system operation • Unit ventilators and (4) HRU's for classroom heating • Library and classrooms are vented using an ERV above the ceiling (This unit is inaccessible) • Science classrooms are vented and heated with ceiling mounted fan coil units
Controls	• Older outdated pneumatic controls

Rockland Middle School

128,000 square feet

***Year Built*: 1997**

***Use:* Middle School**

Facility Equipment Description

Systems	Description
Lighting	• T8 lighting throughout classrooms and office spaces • Exterior HID • Manual switches • Fluorescent lighting
Mechanical/ HVAC	• 2 HB Smith Boilers • (7) HRU units • Oil fired Domestic hot water heater • Radiant floor heating • 14 Rooftop exhaust fans for ventilation
Controls	• Siemens Controls • Web based control system

South School

28,453 square feet

***Year Built*: Original-1949**

Additions- 1995,1999

***Use:* Grades 2-5**

Facility Equipment Description

Systems	Description
Lighting	• T8 lighting throughout classrooms and office spaces • Exterior HID • Manual switches • Fluorescent lighting
Mechanical/ HVAC	• 1 Steam Cleaver Brooks Boiler • 1 Oil fired Smith boiler • 1 Heat Exchanger • DHW served off of boiler • Unit ventilators for classroom and space heating • 1 AHU that serves library and office space • 6 RTU • Unit ventilators for classroom and space heating • 10 Zones of radiant floor heating
Controls	• Older Coleman Controls • Pneumatic controls

Lura Libby

22,200 square feet

***Year Built*: 1949**

Addition- 1954, 1990,1996

***Use:* k-4**

Systems	Description
Lighting	• 32 watt T-8 lighting in classroom and office spaces • No occupancy sensors • Fluorescent lighting in hallways • Exterior HID Lighting
Mechanical/ HVAC	• 1 HB Smith Boiler 2.352 MBH Boiler • 1 Weil McLein Steam boiler • DHW is supplied by either the boilers in the winter or an electric hot water tank in the summers • The 2 older sections of the building use steam radiators for classroom heat • Newer section uses hot water unit ventilators • 1AHU for the multipurpose room (3HP) • The modular classroom addition is heated with propane fired Rinnai units that are direct vented. These are manually operated • The ERV's are operated using the light switches
Controls	• Older Honeywell controls

Thomaston Grammar

34,500 square feet

***Year Built*: 1982**

Addition- 2001

***Use:* 5-8**

Systems	Description
Lighting	• 32 watt T-8 lighting in classroom and office spaces • Older T-12 Lighting in Gymnasium • No occupancy sensors • Fluorescent lighting in hallways • Exterior HID Lighting
Mechanical/ HVAC	• 2 Smith oil fire boilers, (Lead boiler is the newer smaller boiler) • (2) 80 Gallon SuperStor Indirect hot water storage tanks • Heating is provided by in slab radiant heat system with individual zone thermostats (4) • Library space has issues with overheating from the solar wall above that space. The heat captured from the wall overheats that space. • 7 AHU's for heating to the first and second floor pods, gymnasium and woodshop • Classrooms also have baseboard heating with individual thermostats.
Controls	• Older pneumatic controls

Owls Head Central School

11,513 square feet

***Year Built*: 1952**

***Use:* 3-5**

Systems	Description
Lighting	• T8 lighting • Fluorescent lighting in gym • HID Exterior lighting • No occupancy sensor control
Mechanical/HVAC	• **1 Steam HB Smith boiler** • **1 Oil fired Carlin Boiler** • **Unit heaters throughout school** • **Exhaust fans on roof for ventilation** • **DHW served off of boiler**
Controls	• **Boiler controls** • **Low voltage electric controls**

Cushing

13800 square feet

***Year Built*: 2003**

***Use:* k-4**

Facility Equipment Description

Systems	Description
Lighting	• T8 Lighting in classroom and office spaces • Currently no occupancy sensors • Exterior lighting are wall mounted HID lighting
Mechanical/ HVAC	• (2) oil fired Burnham boilers • 3 AHU Units (Classrooms, Library/ART/Admin, Gym/Kitchen) • Classrooms have radiant heat system • Hot water supplied off of the boiler to feed (1) 80 gallon hot water storage tank
Controls	• ACIS web based controls

Gilford Butler

11,641 square feet

***Year Built*: 1955**

***Use:* k-2**

Facility Equipment Description

Systems	Description
Lighting	• T8 lighting • Fluorescent lighting in gym • HID Exterior lighting • No occupancy sensor control
Mechanical/ HVAC	• 1 Steam HB Smith boiler • 1 Oil fired Carlin Boiler • Unit heaters throughout school • Exhaust fans on roof for ventilation • DHW system served off of boilers
Controls	• Low voltage electric

McLain Building

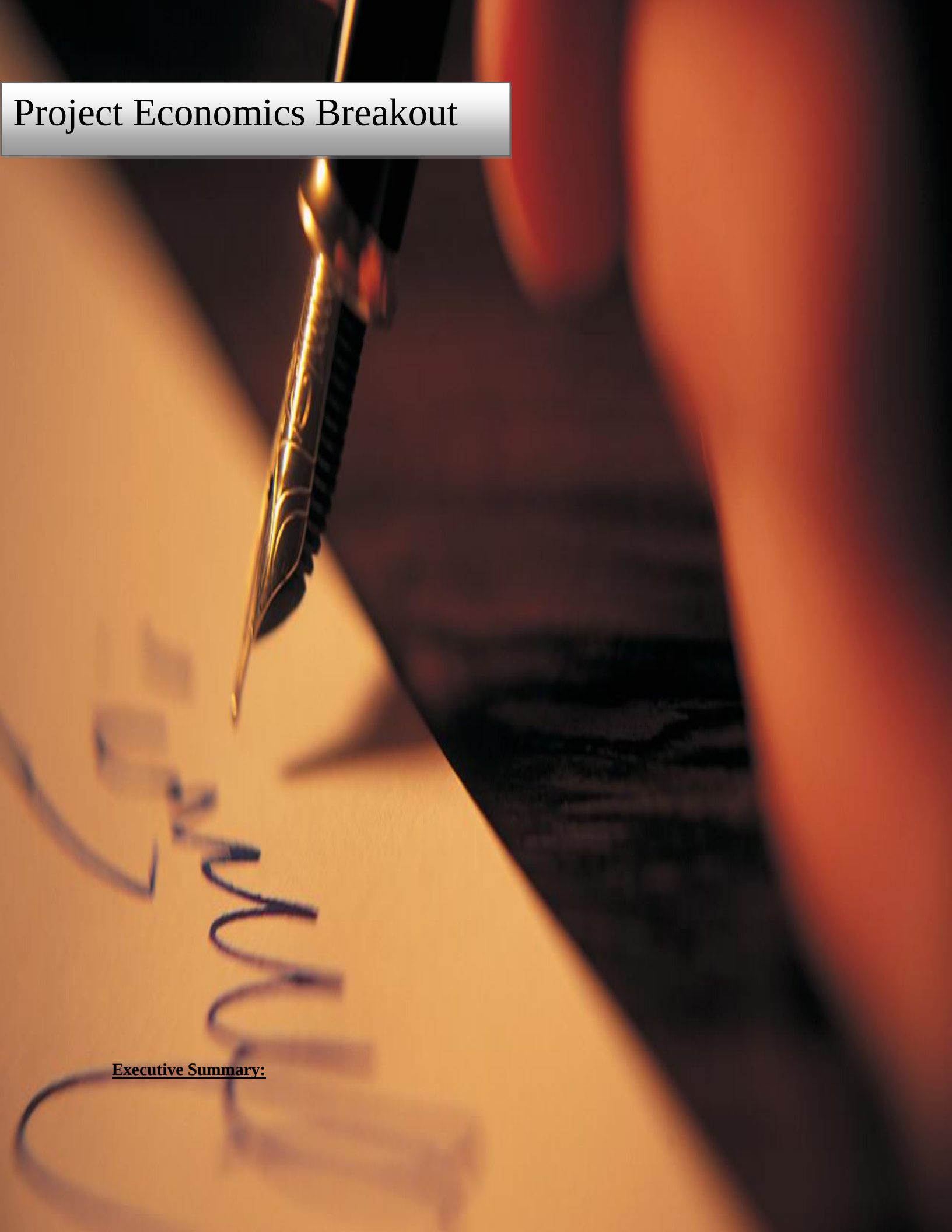
27,950 square feet

***Year Built*: 1894**

***Use:* Central Office**

Systems	Description
Lighting	• T8 lighting • HID Exterior lighting • No occupancy sensor control
Mechanical/ HVAC	• 1 Steam HB Smith boiler • Steam Radiators • DHW
Controls	• Low voltage electric

Project Economics Breakout



Executive Summary:

Siemens provides a comprehensive solution to your building upgrades and cost-containment needs while maintaining a flexible approach. The Siemens Performance Contracting Team consists of highly qualified individuals with years of experience in servicing the energy and building needs of Universities nationwide. Our definition of success is improving the teaching and learning environments for your faculty and students, reducing your costs, and building a long-term business partnership.

Siemens has begun the investment grade audit of ten (10) facilities in the district. These facilities are the Based on our preliminary analysis of the surveyed facilities, Siemens has identified the following savings opportunities specific to each facility and in total. Please reference the *Potential Facility Improvement Measures* section later in this report for a more detailed description of the proposed upgrades.

Table 1.1a: Executive Summary Table – 10% High Preliminary Project Economics

Annual Energy Savings	*Potential Project Size*	*Facilities Operational Savings Only*	*Estimated Utility Rebates/Grants*	*Program Term (Years)*
~$240,000	**~$13,399,000**	**~$530,000**	**$245,000**	**17**

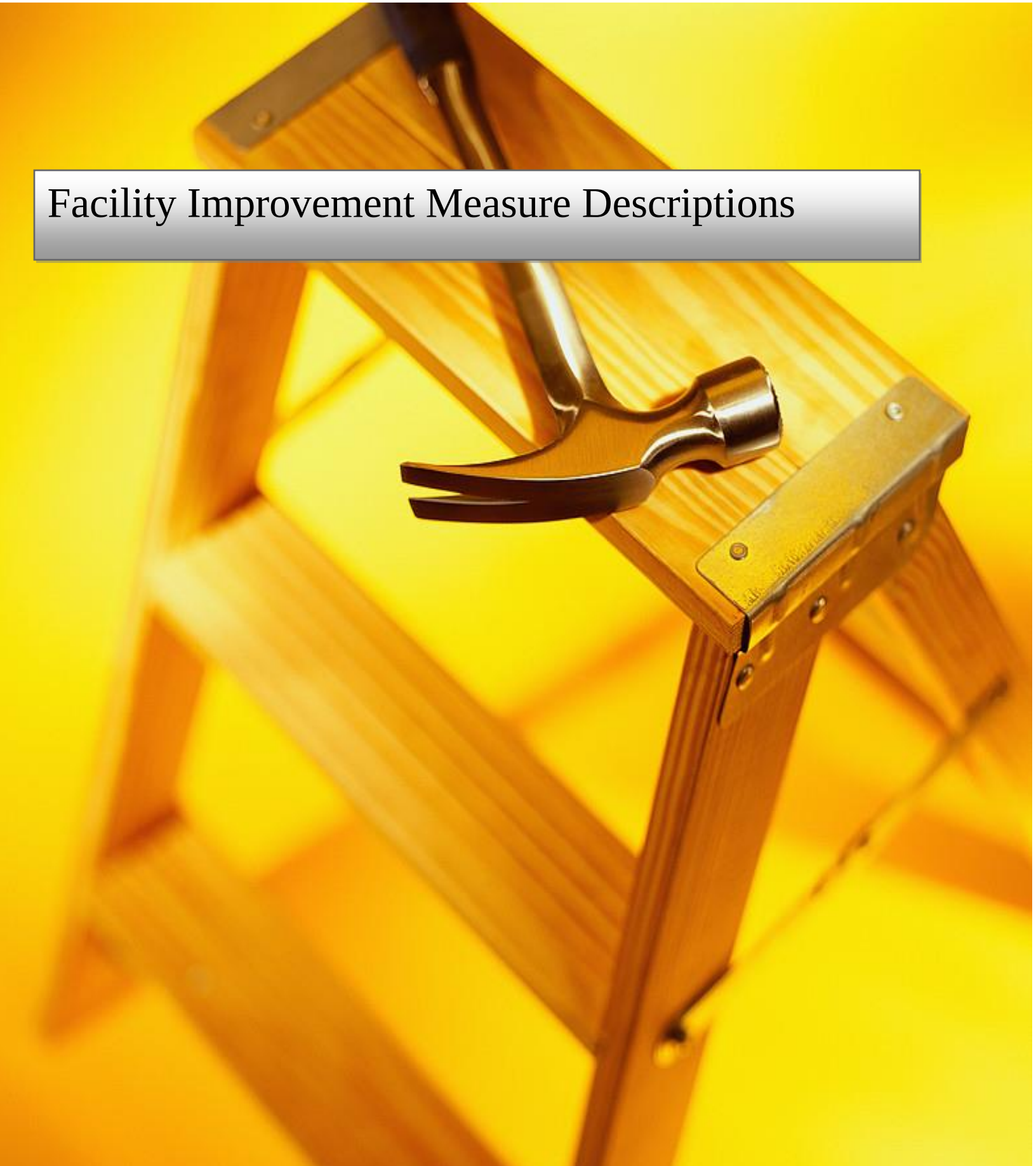
Based off of the projected project size of $13,399,000 over the program term of 17 years with an interest rate of 3%, RSU13 could potentially have a project with a slightly negative cash flow.

Table 1.1b: Executive Summary Table – 10% Low Preliminary Project Economics

Annual Energy Savings	*Potential Project Size*	*Facility Operational Savings Only*	*Estimated Utility Rebates/Grants*	*Program Term (Years)*
~$240,000	**~$12,180,000**	**~$530,000**	**$245,000**	**17**

Based off of the projected project size of ~$12,180,000, over the program term of 17 years with an interest rate of 3%, RSU13 could potentially realize a cash flow positive project.

Facility Improvement Measure Descriptions



Potential Facility Improvement Measures (FIMs)

As a result of the preliminary site investigation, Siemens has identified the following potential Facility Improvement Measures (FIMs) at your facilities. Please note, at this time it is not known if all of the improvements listed below can be supported by the energy savings generated from the program. The final scope of work will depend on the contract term, financing rates, utility rates and many other variables that will be addressed during the Detailed Audit. Other non-energy savings infrastructure improvements can also be analyzed during the Detailed Audit with the goal of using any excess energy savings to help offset the cost of these improvements.

The following FIM Matrix summarizes the applicable FIMs that were identified for each facility during the preliminary investigation:

FIM Description	*Ocean Side High East*	*Ocean Side High West*	*Rockland Middle School*	*South School*	*Thomaston Grammar*	*Lura Libby*	*OwlS Head*	*Cushing*	*Gilford Butler*	*McLain Building*
Lighting Upgrades	•	•	•	•	•	•	•	•	•	•
Building Automation Improvements	•	•	•	•	•	•	•	•	•	•
Building Envelope	•	•	•	•	•	•	•	•	•	•
Kitchen Refrigeration Controls	•	•	•							
Kitchen Improvements	•	•							•	
Plug Load Controllers	•	•	•	•	•	•	•	•	•	•

FIM Description	*Ocean Side High East*	*Ocean Side High West*	*Rockland Middle School*	*South School*	*Thomaston Grammar*	*Lura Libby*	*OwlS Head*	*Cushing*	*Gilford Butler*	*McLain Building*
Window Retrofits	•	•		•	•	•	•	•	•	•
Mechanical Improvements	•	•	•	•	•	•	•	•	•	•
Ventilation Improvements	•	•		•	•	•	•		•	
High Efficiency Air Conditioning	•					•				•
Energy Efficiency Improvements for Technology	•	•	•	•	•	•	•	•	•	•
Classroom Environmental Improvement		•				•	•		•	
Miscellaneous Capital Improvement Measures	•	•				•	•	•	•	•

FIM-1 Lighting Upgrades

The majority of the lighting in the surveyed facilities consists of older, 32 Watt, T-8 fluorescent fixtures with electronic ballasts, along with incandescent fixtures. Throughout the district there are exterior metal halide HID fixtures. Exit signs are illuminated by a combination of incandescent, compact fluorescent and LED technology.

Where economically feasible, Siemens proposes to retrofit the existing T-8 fluorescent fixtures to Sylvania Xtreme Super T-8 system. This system is one of the lowest wattage systems on the market today utilizing the 28w T-8 lamp and the high efficiency super saver ballast. This will result in a 20-30% savings over the existing T-8. Siemens will also retrofit any incandescent lighting fixtures to compact fluorescent units where economically feasible and replace all incandescent and compact fluorescent EXIT signs with LED illuminated signs.

- **Interior Lighting:** The majority of the lighting scope is to install LED lighting throughout the facility
- **Exterior Lighting:** The majority of the lighting scope is to install LED lighting to replace existing LED.
- **Occupancy Sensors Expansion:** Siemens will install occupancy sensors to turn-off lighting automatically during unoccupied periods to save energy in areas where they are currently not installed.
- **Addition energy saving devices installed during lighting retrofit includes:**
- **Vending Misers:** Vending misers will be installed on the snack and beverage machines in the facilities to reduce the energy consumption while not in use.
- **Destratification fans:** Destratifation fans will recover wasted heat by eliminating heat stratification. Trapped warm air at the ceiling caused by natural heat rise.

FIM-2 Building Automation Improvements

HVAC equipment in the surveyed facilities is currently controlled by a mixture of electronic systems. Many functions are also controlled manually. The lack of proper controls results in less than desirable comfort conditions and excessive energy usage.

In order to reduce energy consumption and improve occupancy comfort, Siemens proposes to install new Direct Digital Controls in the applicable facilities. The new systems shall be supplied with all the necessary software to perform the specified functions. The system shall all revert back to a common front end where the facilities staff can access it remotely. The following system software shall be supplied as a minimum:

- 365 day Zone Scheduling
- Optimum Start/Stop
- Historical Tracking Database
- Full Color Graphics
- Logical programming functions

An example of your current baseline is provided below. This data was obtained from the temperate loggers deployed throughout the facilities. It monitored temperature at 15 minute intervals for the time period of 4/27/2015-5/19/2015. Once the data was retrieved it was analyzed to represent temperature differences between unoccupied and occupied times. As seen in the data below from Oceanside High School East the occupied and unoccupied temperatures have a small differential. This shows a great energy savings potential for a temperature setback during unoccupied periods.

OHS East Temperature Logger Summary	Logging Period		Average Temperatures		
Space Name	**Start**	**End**	**Temp**	**Occ**	**Unoc**
Classroom 23	4/27/2015	5/19/2015	71.0	72.6	70.2
Gym	4/27/2015	5/19/2015	74.0	73.4	74.2
Library	4/27/2015	5/19/2015	72.8	71.1	73.5
Classroom 34	4/27/2015	5/19/2015	70.6	71.5	70.2
Cafeteria	4/27/2015	5/19/2015	72.2	74.1	70.3
AVERAGES, TOTALS	22.74	days	72.1	72.6	71.7

The following are some of the proposed control sequences which will be used to save energy and reduce operating costs:

- Night Setback
- Scheduled Start/Stop
- Optimum Start/Stop control of HVAC System Equipment
- Hot Water Temperature Reset
- Summer-Winter Operation Monitoring
- Demand Control Ventilation

The Automation scope per building is broken out below:

Cushing

- Integrate DDC control system into Siemens Front End
- Install CO2 based demand control ventilation on AHU 1,2 and 3
- Install Delta VFD and pressure control on new 3 HP pump

Laura Libby

- Integration of new condensing boiler into Siemens Front end
- Install CO2 based demand control ventilation on H&V 1
- Install occupancy based demand control ventilation on UV-1, 2 , 3 and 4
- Provide DDC Automated control including occupancy based demand control ventilation on HRV 1, 2,3 and 4 in 1996 wing
- DDC Control of through wall heaters TWH 1,2,3 and 4
- Install Delta VFD and pressure control on new 3 HP pump
- DDC Integration of New Condensing Gas Boiler
- DDC start/stop of existing Non-Condensing boiler
- Start stop control for EF 2, 3, 4
- DDC Automated control of FP-A and B, Convector C1, Unit Heater CUH-1 and 2, UH 1, 2 and 3
- DDC Automated control of New Fin Tube FP 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18
- Install CO2 based demand control ventilation on New ERV-1

Gilford Butler

- Install CO2 based demand control ventilation on New ERV-1
- DDC Automate control of 9 existing zone valves
- DDC Start/Stop of existing steam boiler
- Start stop control for EF

Owls Head

- Integration of new condensing boiler into Siemens Front end
- Install CO2 based demand control ventilation on H&V 1
- DDC Integration of (2) New Condensing Gas Boiler
- Start stop control for Exhaust Fans
- DDC Automated control of New Fin Tube FP 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18
- DDC Automation with CO2 based demand control ventilation on on New ERV-1 and ERV -2

McLain Building

- DDC Integration of (2) New Condensing Gas Boiler
- DDC Automation of new 2 HP pumps with differential pressure control.
- DDC Automated control of New Fin Tube FP 1-26
- Start stop control for Exhaust Fans

Thomaston Grammar

- Integration of new condensing boiler into Siemens Front end
- DDC Automated control of Cabinet Unit Heater A,B,C,D
- Install CO2 based demand control ventilation on H&V 1,2,3,4
- Start stop control for Exhaust Fans EF 1 to 16 and TF 5, 6
- DDC Integration of New Condensing Gas Boiler
- DDC start/stop of existing Non-Condensing boiler
- DDC Automated control of Existing Fin Tube FP 1-28
- DDC Automation of Solar wall heat distribution

South School

- DDC Automated control of Radiant Floor Zone P 1, 2, 3, 4, and 5

- DDC Automated control of Heat Recovery Ventilation Unit HRVU 1, 2 and 3
- DDC Automation of HVAC 1, 2, 3, 4, 5 and 6 with demand Control Ventilation
- DDC Control of through wall heaters TWH 1,2,3 and 4
- DDC Control of Unit Ventilators with occupancy based demand Control Ventilation
- DDC Automated control of New Fin Tube

OSH-East

- Integration of new condensing boiler into Siemens Front end
- DDC Automation with CO2 based demand control ventilation on New ERV-1, 2, 3, 4, 5, and 6
- Install Delta VFD and pressure control on existing pump

OSH-West

- Integration of new condensing boiler into Siemens Front end
- DDC Automation with CO2 based demand control ventilation on Library Air Handler
- DDC Automation with CO2 based demand control ventilation on Gym Air Handler and Exhaust Fan
- DDE Automation with CO2 based demand control ventilation on New ERV with demand control ventilation.
- DDC Automation with occupancy based demand control ventilation on ERV in class room 10,17, 18, 19 and 20
- DDC Automated control of Existing Fin Tube and cabinet unit heaters

Rockland Middle School

- Integration of new condensing boiler into Siemens Front end
- Convert all 3-way valves to 2-way valves
- Install Delta VFD and pressure control on new 10 HP pump
- DDC Automation with CO2 based demand control ventilation on OAVU/HRVU 1, 2,3,4,5,6,and 7
- DDC Automation with CO2 based demand control ventilation on HRVU 1, 2,3,4,5,6,and 7

FIM-3 Building Envelope Improvements

Air leakage has been shown to represent the single largest source of heat loss or gain through the building envelopes of nearly all types of buildings. Beyond representing potential for energy savings, uncontrolled air leakage can affect the thermal comfort of occupants, air quality through ingress of contaminants from outside and the imbalance of mechanical systems. The structural integrity of the building envelope can also be compromised through moisture migration. Control of air leakage involves the sealing of gaps, cracks and holes, using appropriate materials and systems, to create, if possible, a continuous plane of "air-tightness" to completely encompass the building envelope. Part of this process also incorporates the need to "decouple" floor - to - floor, and to "compartmentalize" components of the building in order to equalize pressure differences.

The scope for this measure includes Air Sealing at all schools and Insulation Air Barriers where applicable. Air Sealing will consist of exterior and vestibule doors to be weather-stripped for an improved barrier to the outdoor air. Current exhaust duct penetrations to attic spaces would be sealed to avoid unwanted heat transfer.

The scope for this measure includes:

Cushing Community School

Air Sealing

12 Single commercial doors to be weather-stripped

3 Double commercial doors to be weather-stripped

8 Sewer exhaust penetrations in attic floor to be sealed

8 Bathroom exhaust duct penetrations to be sealed in attic floor

1 Chimney stack penetrations to be sealed (fire block sealant)

1 Kitchen exhaust hood penetration to be sealed (fire block sealant

Gilford Butler School

Air Sealing

1 Single commercial doors to be weather-stripped

4 Double commercial doors to be weather-stripped

1 Overhead garage door to be weather-stripped, 36 linear feet

7 Pipe/conduit penetrations to be sealed (fire block sealant)

Insulation/Air-Barrier

3,456 Square feet of ½" Dow Thermax Sheathing to be installed to underside of bottom chord of roof trusses all seams sealed with FSK tape and/or 2-component fire rated foam, all foam to be coated with DC315 Intumescent paint. (air-barrier retrofit)(rooms 2,4,5,6)

Lura Libby School

Air-Sealing

4 Single commercial doors to be weather-stripped

3 Double commercial doors to be weather-stripped

222' Roof/wall joint to be sealed, all foam to be coated with DC315 Intumescent paint

3 Exterior brick vents (currently filled with fiberglass insulation) to be covered with painted galvanized covers

Oceanside High School East

Air Sealing

14 Single commercial doors to be weather-stripped

12 Double commercial doors to be weather-stripped

1 Single commercial roof access to be weather-stripped

2 Overhead garage doors to be weather-stripped, 92 linear feet

23 Roof top ventilators to be opened, dampers lubricated and perimeters sealed, 176 linear feet

114’ Roof/wall joint to be sealed, all foam to be coated with DC315 Intumescent paint

186’ Roof/wall joint to be sealed, all foam to be coated with DC315 Intumescent paint

3 Bulkheads to be sealed, all foam to be coated with DC315 Intumescent paint, 30 linear feet

Oceanside High School West

Air-Sealing

10 Single commercial doors to be weather-stripped

8 Double commercial doors to be weather-stripped

1 Interior overhead garage door to be weather-stripped, 40 linear feet

10 Roof top ventilators to be opened, dampers lubricated and perimeters sealed, 40 linear feet

78’ Roof/wall joint to be sealed, all foam to be coated with DC315 Intumescent paint

51’ Roof/wall joint to be sealed, all foam to be coated with DC315 Intumescent paint

1 Bulkhead to be sealed, 12 linear feet, all foam to be coated with DC315 Intumescent paint

Insulation/Air-Barrier

6,876 Square feet of ½” Dow Thermax Sheathing to be installed to underside of bottom chord of roof trusses all seams sealed with FSK tape and/or 2-component fire rated foam, all foam to be coated with DC315 Intumescent paint. (air-barrier retrofit)(rooms 30-35)

Owls Head

Air-Sealing

1 Single commercial doors to be weather-stripped

4 Double commercial doors to be weather-stripped

1 Attic hatch to be insulated with 4” Dow Thermax Sheathing and weather-stripped, approx. 24”x30”

Rockland District Middle School

Air-Sealing

7 Single commercial doors to be weather-stripped

6 Double commercial doors to be weather-stripped

1 Interior single commercial door to be weather-stripped

672’ Sheetrock ceiling/wall joint to be sealed, all foam to be coated with DC315 Intumescent paint

5 Attic hatches to be weather-stripped, 80 linear feet

1 Attic hatch to be installed, 22.5”x22.5” (cafeteria storage)

132 Windows to be caulked at the interior perimeters, 2,357 linear feet

South School

Air-Sealing

6 Single commercial doors to be weather-stripped

8 Double commercial doors to be weather-stripped

2 Interior single commercial doors to be weather-stripped

3 Roof top ventilators to be opened, dampers lubricated and perimeters sealed, 12 linear feet

219’ Roof/wall joint to be sealed, all foam to be coated with DC315 Intumescent paint

1 Door buck header to be sealed, 10 linear feet

66’ Interior soffit joints to be sealed, all foam to be coated with DC315 Intumescent paint

11 Light wells in ventilated ceiling space to be covered and sealed, all foam to be coated with DC315 Intumescent paint

11 Relief vents in classroom closets to be covered and sealed, 13”x13” each

27 Windows to be caulked at perimeters, 1,008 linear feet (wooden double pane units)

20 Windows to be caulked at perimeters, 423 linear feet (aluminum single pane units)

Insulation/Air-Barrier

210 Square feet of ½” Dow Thermax Sheathing to be installed to underside of bottom chord of roof trusses all seams sealed with FSK tape and/or 2-component fire rated foam, all foam to be coated with DC315 Intumescent paint. (air-barrier retrofit)(hallway between portable building and main building)

Thomaston Grammar School

Air-Sealing

3 Single commercial doors to be weather-stripped

4 Double commercial doors to be weather-stripped

10 Roof top ventilators to be opened, dampers lubricated and perimeters sealed, 50 linear feet

509’ Roof/wall joint to be sealed, all foam to be coated with DC315 Intumescent paint

Insulation/Air-Barrier - $489.00

2 Window header framing to be insulated with 4” Dow Thermax Sheathing, 40 square feet

McLain Building

Air-Sealing

2 Double commercial doors to be weather-stripped (new doors, but would benefit from external mounted weather-stripping) (dark bronze anodized trim)

4 Rescue windows to be weather-stripped, 37”x37” each

1 Door casing to be caulked at interior, at sides and top, 34 linear feet

2 Attic access doors to be weather-stripped

32 (approx.) Square feet of 5/8” sheetrock to be installed over areas in disrepair, 3rd floor storage area at rear attic entrance.

1 Exterior louver in oil tank room to have insulated hinged door installed, 43”x43”

FIM-4 Kitchen Refrigeration Improvements

The Scope of this measure includes updated motors and controls for the walk in cooler and freezers and the High Schools and Rockland Middle School. Below is an explanation of the upgrades being proposed:

1. Evaporator fan control- Cycling of evaporator fan motors when thermostat satisfied/compressor off-line, fans run continuously during time compressor on-line.
2. Freezer door heater control- Door heater circuit controlled as a function of relative humidity, monitored by humidistat located at door.
3. Evaporator fan motor replacement. Replacement of cooler/freezer evaporator fan motors with ECMs (Electronically Commutated Motors).
4. Cooler door heater control. Door heater circuit controlled as a function of relative humidity, monitored by humidistat located at door.
5. Open Case LED – Replace lighting in open cases with LED lighting

FIM- 5 Food Service Improvement Measure

The Following scope is describes the cafeteria improvements being proposed at the district high schools:

OHS-East

- Expand and Update kitchens to increase effectiveness and add space to meet Maine Department of Education Space Allocation Guidelines Dated January 2015.

OHS-West

- Expand and Update kitchens to increase effectiveness and add space to meet Maine Department of Education Space Allocation Guidelines Dated January 2015.

FIM-6 Plug Load Controllers

The recommended scope of this measure is to install controllers on all controllable plug loads. Any plug load that can be turned off during unoccupied period will be to reduce energy usage of the schools. Plug load is any electric device that plugs into an electrical plug.

FIM-7 Window Retrofit

OHS East

- Recommended replacement of the gym area windows with Kalwall system, white translucent insulated panels that have a U factor of .28 for the systems and .23 for panels.
- Approximately 13,400 square feet of building have 2 proposed options:
    - Op. 1- Replace with standard center set storefront standard finish with insulated panel in the lower section as existing, insulated panel in top section and install ½ as many operable vents as in existing layout all low-e argon glass, approx. U factor .4
    - Op. 2- Replace with Peerless G300 series fixed and project out as existing layout with standard peerless painted finish, low-e argon glass U value .334

OHS West

- Install Harvey classic windows in the primary library area using U factor .3 windows,

- Another concern is the 5 dome skylights in the library that appear fogged and do not match. Recommend replacing the bubbles with all tinted new dbl layer bubbles by Wasco.

South School

- The proposed scope for the large windows in the east end that are old single glazed windows would be to replace them with a storefront system that have a few operable vents, similar to existing but will utilize more glass area, less framework and a new door and frame. This holds a U value in the area of .39

- The 21 aluminum sliders some have already been replaced with 2 mulled double hung windows, and the proposed scope would be continuing that solution with Harvey classic vinyl mulled double Hungs and a receptor system in masonry openings U value .3

Gilford Butler

- The proposed scope recommends replacing the existing windows with approximately a .43 U Value and new Harvey Classic replacement vinyl windows with low-e argon with a U-value of .3.

Lura Libby

- Recommended scope is to place the doors that are in poor shape at the main entrance and secondary front door with an aluminum entrance custom paint and hardware to match existing function and appearance.

Thomaston Grammar

- Install a new Kalwall translucent insulated panel system, that is similar in design to the current, to replace the failing existing panel system. The Kalwall panels are U.23 with a U.28 system rating.

Owls Head

- Recommended replacement of 38 windows with a Harvey window, similar in design and function, with a .3 U factor, to the existing windows that have been replaced over the last few years. The Harvey window will perform slightly better than the current windows that have had a few maintenance issues but overall are operable.

McLain Building

- Recommended solution is to replace the existing previously double hung style windows that are non-thermal aluminum, single glaze, and little to no efficiency, with the Harvey classic low-e argon foam filled U factor .3 double hung and fixed windows that are appropriate for openings (over 60" tall would have fixed on top)

FIM-8 Mechanical Improvements

Siemens proposes the replacement of older oil fired boilers, with new high efficiency propane fired hot water boilers. Many of the existing boilers are well beyond their useful service life and present a tremendous maintenance liability due to their age and do not take advantage of vast design improvements in recent years that dramatically improve boiler efficiency and performance. The existing boilers do not operate at the same turndown ratios of currently available boilers and are more likely to be inefficient at low loads. Additional boiler inefficiencies include:

- Over sizing
- Poor combustion efficiency
- Old and inefficient heat transfer design
- Excessive jacket heat losses due to a lack of insulation and increased surface area

The installation of the new boilers will not only save energy, but will also improve system reliability and reduce maintenance and repair costs. Below are breakdowns by building of the mechanical improvements proposed:

OHS-East

- Install a Propane (Convertible to Natural Gas) Fired Boiler sized to match 90% of the load
- Conversion of existing Boiler to Propane (Convertible to Natural Gas)
- Remove oil tank

OHS-West

- Install Propane (Convertible to Natural Gas) Fired Boiler sized to match 90% of the load
- Conversion of existing Boilers to Propane (Convertible to Natural Gas)
- Remove oil tank
- Install booster heat coils in duct from ERV in class room 10,17, 18, 19 and 20
- Repair Domestic Hot water system.

RDMS

- Install Propane (Convertible to Natural Gas) Fired Boiler sized to match 90% of the load
- Conversion of existing Boiler to Propane (Convertible to Natural Gas)
- Remove oil tank

Cushing

- Install Propane Fired Boiler sized to match 90% of the load
- Install Duel Fuel Burner on existing Boilers
- Convert Valves on Air Handlers from Three-Way to Two Way

Laura Libby

- Install Propane Fired Boiler sized to match 90% of the load
- Convert existing Weil McLain 1088 boiler to hot water and install a propane (future natural gas burner)
- Remove oil tank
- Install two new pump sized for 160 GPM and 35 ft Head
- Install heating coils in room HRV in 1996 sections.

McLain Building

- Install 2 Condensing Propane (Convertible to Natural Gas) Fired Boilers
- Remove Oil Tanks
- Install 2 new 2 HP pumps
- Convert existing Fin to forced hot water heat
- Replace existing radiators with fin tube radiation.

Owls Head

- Install 2 Condensing Propane Fired Boilers
- Remove Oil Tanks
- Install 2 new 3 HP pumps
- Replace existing radiators with fin tube radiation.
- Install new fin-tube in addition.
-

Thomaston Grammar

- Install Propane (Convertible to Natural Gas) Fired Boiler sized to match 90% of the load
- Conversion of existing Boiler to Propane (Convertible to Natural Gas)
- Remove oil tank

South School

- Connect heating system to Middle School boiler plant
- Remove Oil Tanks
- Replace existing radiators with fin tube radiation.

Convert existing heating coils to forced hot water heat

FIM 9- Ventilation Improvements

The proposed scope for this measure is broken out by building. The measures proposed are for increased ventilation and improvements to bring the buildings up to ASHRAE62.1 ventilation standards.

Laura Libby

- Install new Roof mounted 1500 CFM ERV to serve 1949 and 1954 sections, capping and sealing unused exhaust fans opening.

OHS-East

- Install three (3) Energy Recovery Ventilators supplied into classroom and exhausted from hallways.
- Install one New Energy Recovery Ventilator for Gym Area to replace existing H&V Unit
- Install one New Energy Recovery Ventilator for Library
- Install one New Energy Recovery Ventilator for Locker Room
- Install one New Energy Recovery Ventilator for Auditorium

OHS-West

- Install ERV to Preconditioned air for Unit Ventilators in science wing
- Install ERV to provide ventilation to provide ventilation for portion of school not currently ventilated.

Rockland Middle School

- Install bypass duct in OAVU/HRU 1,2,3,4,5, 6 and 7

Thomaston Grammar

- Install fans and dampers to use existing solar wall to pre-heat ventilation air from existing solar wall.

Gilford Butler

- Install (2) new ERVs to provide ventilation to the school, one unit would serve the 2nd floor and one would serve the basement.

Owls Head

- Install (2) new ERVs to provide ventilation to the school, one unit would serve the existing classrooms and one would serve the addition.

FIM 10 High Efficiency Air Conditioning

OHS-East

- Install 4 high Efficiency ductless split heat pump systems to replace existing window units.

OHS-West

- Install 2 high Efficiency ductless split heat pump systems to replace existing window units.

Laura Libby

- Install 2 high Efficiency ductless split heat pump systems to replace existing window units.

McLain Building

- Install a 12 cassette a Heat Pump VRF system to provide air conditioning.

FIM 11 Technology Energy Efficiency Improvements

The scope of this measure is to address the district technology concerns and implement new energy efficient server's district wide.

FIM 12 Classroom Environment Improvement Measure

Laura Libby

- Dispose of this facility

OHS-East

- Install insulated wall in shop area converted to classroom area where overhead door was located.
- Remodel Locker Room
- Address drainage once Oil tank is removed

Gilford Butler

- Dispose of this facility and reassign children and teachers to other schools.

Owls Head

- Remodel existing classroom area.
- Build a 5,000 square feet for additional classroom space to meet Maine Department of Education Space Allocation Guidelines Dated January 2015.
- Build a 1000 square feet for new boiler room, kitchen and mechanical space

FIM 13 Accessibility Improvement Measure

The scope of this measure is to install a locker room lift at OHS East and address the concern of accessibility in that specific location.

FIM 14 Electrical System Upgrade and Misc repairs

OHS-East

- Add subpanels and outlets to match the electrical equipment of new technology

OHS-West

- Add subpanels and outlets to match the electrical equipment of new technology
- Replace roof section 9

FIM 15 On-Site Renewable Energy

OHS-East

- Install (5) panel thermal solar panel connected to existing domestic hot water tank.